Committee on Resources

Witness Testimony

STATEMENT OF ROBERT W. MUTCH
BEFORE THE
COMMITTEE ON RESOURCES
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OVERSIGHT HEARING

"USE OF FIRE AS A MANAGEMENT TOOL ON THE NATIONAL FORESTS"

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Mr. Chairman and Members of the Committee:

It is a privilege to appear before this Committee today to highlight the critical importance of linking silvicultural prescriptions with prescribed fire opportunities on a large enough scale to restore and sustain the health of fire-adapted ecosystems in the United States.

DOUBLE STANDARD SLOWS PRESCRIBED FIRE PROGRESS

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SUMMARY

A recent survey conducted by Forest Service research indicated that over five million acres are treated annually by prescribed fire in the United States, mostly in the South and Southeast. Purposes for using prescribed fire included hazard reduction, vegetation management, range improvement, wildlife habitat improvement, and other reasons.

But a double standard dramatically hampers our ability to prescribe fire on the landscape on a large enough scale to truly make a difference. Even five million acres is quite inadequate, especially in the West, where insufficient prescribed fire projects are conducted on large Federal holdings on an annual basis.

The double standard is one where practically any strategy can be adopted in suppressing a wildfire and vast amounts of money can be spent in implementing that strategy. No matter how adverse the outcome, politicians and the public generally side with the fire suppression specialist. A prescribed fire, on the other hand, can be well-planned and well-executed, but if anything starts to go awry the support from politicians, the public, and even internal colleagues, is quickly lost. This double standard is part of our tradition and culture, because the wildfire suppression decision is generously funded and essentially risk-free in the public arena, whereas prescribed fire implementation is much more closely scrutinized and carries a large risk. A few examples exist today where the double standard is being challenged and more latitude is being provided

for prescribed fire.

The following "lessons learned" can be applied in dealing with the declining forest health problem in the western U.S.:

1. Most forest ecosystems (plants and animals) are adapted to fire.

2. It is not a question of if a fire will occur, but only when and where. There will be fire and there will be smoke.

3. Either pay now for a more balanced program of fire prevention, wildfire suppression and prescribed fire, or pay a dear price later due to escalating losses of people, property, and natural resources in uncontrollable wildfires.

4. Silvicultural and fire prescriptions must be integrated on a much larger scale to restore ecosystem health. This will require pre-commercial thinning and carefully planned cutting to restore stand densities and species composition that are sustainable into the future. Many stand conditions are so flammable today as a result of fire exclusion that prescribed burning without prior silvicultural treatment would be tantamount to igniting a conflagration.

5. Fortunately silvicultural cutting treatments designed to maintain healthy forests often will pay the way for follow-up hazard reduction burning.

6. The "buck needs to stop here." Risk for expanded prescribed fire projects must be shared among all stakeholders: agencies, politicians, and the public.

FIRE IN WILDLANDS

Periodic forest, grassland, and tundra fires are part of the natural environment--as natural and vital as rain, snow, or wind (Heinselman 1978). Evidence of past fires and their periodicity is found in charcoal layers in lakes and bogs; and in the fire-scarred cross sections of trees. Fire-adapted ecosystems that are found throughout North America are termed fire-dependent, if recurring disturbances by fire are essential to the functioning of these systems (Heinselman 1978). Numerous examples have been documented on how fire affects the functioning of ecosystems: regulating plant succession; regulating fuel accumulations; controlling age, structure, and species composition of vegetation; affecting insect and disease populations; influencing nutrient cycles and energy flows; regulating biotic productivity, diversity, and stability; and determining habitats for wildlife.

Lightning, volcanoes, and people have been igniting fires in wildland ecosystems for millenia. The current emphasis on ecosystem management calls for the maintenance of interactions between such disturbance processes and ecosystem functions. It is incumbent, therefore, on resource managers and fire managers to understand the historic frequency, intensity, and areal extent of past fires. Such knowledge provides a frame of reference for prescribing appropriate management practices on a landscape scale. Many studies have described the historical occurrence of fires throughout the world. Swetnam (1993), for example, reported on 2000 years of fire history in giant sequoia groves in California. He found that frequent small fires occurred during a warm period from about A.D. 1000 to 1300, and less frequent but more widespread fires occurred during cooler periods from about A.D. 500-1000 and after 1300. However, throughout the 2000 years of record fires occurred at intervals of less than 25 years, until the last century when agencies have been able to

eliminate the pattern of frequent fires. Thus, several decades of attempted fire exclusion have threatened long-lived Giant Sequoia trees with fatal crown fires where the trees had co-existed previously for thousands of years with low intensity surface fires.

Swain (1973) determined from lake sediment analysis in the Boundary Waters Canoe Area in Minnesota that tree species and fire had interacted in complex ways over a 10,000 year period. There is an even larger body of science that details the numerous effects of wildland fires on ecosystems. It is this knowledge of fire history, fire regimes, and fire effects that allows managers to develop silvicultural prescriptions, fire prescriptions, and prescribed fire programs to achieve a variety of resource management objectives.

The role of fire as an important disturbance process has been highlighted in a classification of continental fire regimes (Kilgore and Heinselman 1990). They described a natural fire regime as the total pattern of fires over time that is characteristic of a region or ecosystem. Fire regimes are defined in terms of fire type and intensity, typical fire sizes and patterns, and fire frequency, or length of return intervals in years. Natural fire regimes of North America are placed into seven classes, ranging from Class 0 where fires are rare or absent to Class 6 where crown fires and severe surface fires occur at return intervals longer than 300 years. Intermediate fire regimes are characterized by increasing fire return intervals and increasing fire intensities. Class 2, for example, describes the situation for long-needled pines, like longleaf pine, ponderosa pine, and Jeffrey pine, where low intensity, surface fires occurred rather frequently (return intervals of less than 25 years). Lodgepole pine, jackpine, and the boreal forest of Canada and Alaska generally fall into Class 4, where high intensity crown fires occurred every 25 to 100 years; or into Class 5 where crown fires occurred every 100 to 300 years.

The noteworthy aspect of continental fire regimes for our consideration is that very few plant communities, or ecosystems, in North America fall into Class 0 where fires are rare or absent. In other words, most ecosystems in the United States evolved in environments where wildland fires occurred in a consistent manner, establishing fire as a process that affects the numerous ecosystem functions described earlier. The application of prescribed fire for many different purposes has attempted to mimic the natural role of fire in producing fire-related ecosystem effects. Our problem, as we shall see later, is simply one where we have not used enough prescribed fire on a large scale to sustain the productivity of fire-adapted ecosystems.

DECLINING FOREST HEALTH

Numerous ecosystem indicators, however, from the Southeast to the West are presenting alarming examples of declining forest health. Attempted fire exclusion practices, prolonged drought, and epidemic levels of insects and diseases have coincided to produce extensive forest mortality, or major changes in forest density and species composition. Gray (1992) called attention to a forest health emergency in parts of the western United States where trees have been killed across millions of acres in eastern Oregon and Washington. He indicated that similar problems extend across a much larger area south into Utah, Nevada, and California, and east into Idaho. Denser stands and heavy fuel accumulations are also setting the stage for high intensity crown fires in Montana, Colorado, Arizona, New Mexico, and Nebraska, where the historical norm in long-needled pine forests was for more frequent low intensity surface fires (fire regime Class 2).

Since the 1980's, large wildfires in dead and dying western forests have accelerated the rate of forest mortality, threatening people, property, and natural resources (Mutch 1994). These wildfires also have emitted large amounts of particulate matter into the atmosphere. One study (Hardy and others 1992) estimated that more than 53 million pounds of respirable particulate matter were produced over a 58-day period by the 1987 Silver Fire in southwestern Oregon! Yet wildfires are generally looked upon as

exceptional events by the Environmental Protection Agency, and are outside their purview as they promulgate clean air strategies. These wildfires, however, can no longer be considered exceptional events. More than 50 years ago Weaver (1943) reported that the "complete prevention of forest fires in the ponderosa pine region of California, Oregon, Washington, northern Idaho, and western Montana has certain undesirable ecological and silvicultural effects...conditions are already deplorable and are becoming increasingly serious over large areas." Also, Cooper (1961) stated that "fire has played a major role in shaping the world's grassland and forests. Attempts to eliminate it have introduced problems fully as serious as those created by accidental conflagrations."

Some have said that we have been engaged in a "grand ecological experiment" as we attempt to exclude fire from fire-adapted ecosystems. Even in the southeastern United States where the majority of prescribed burning is conducted, a recent report indicated that there were 90 million acres of longleaf pine during the late nineteenth century. Current inventories accounted for 2.9 million acres of longleaf pine today; and projected that longleaf pine was being lost at the rate of 100,000 acres a year. One reason attributed to this decline was the absence of fire, contributing to a type conversion to hardwoods.

WILDFIRE SUPPRESSION

The clarity of hindsight might move some to question resource management agencies for their slowness in responding to clear warnings that were sounded in the 1940's and 1960's by people like Weaver and Cooper. But that would be a simplistic assessment for a complex situation. Resource management and fire management policies, regulations, and practices evolve gradually over time and are affected by many internal and external expectations. The external expectations may come from society at large, politicians, and regulatory agencies. Many of the early internal and external expectations were founded on the calamities brought about by catastrophic fires in the late 1800's and early 1900's. Wildland fires were viewed as the enemy to be eradicated from the forests, not as a natural disturbance process with many benefits. The several era's of fire control and fire management from then to now have been carefully traced by Pyne (1982). So it is not really surprising in the aftermath of the extensive 1910 wildfires that an organizational culture developed that emphasized fire suppression programs over prescribed fire programs; program emphasis that was universally accepted by society and politicians. But in the intervening decades since 1910, a large body of scientific knowledge has developed regarding fire history, fire regimes, and fire effects; the decline in the health of ecosystems has reached alarming proportions; and large, high intensity wildfires are increasing in numbers since the mid-1980's.

PRESCRIBED FIRE

How widespread is the use of prescribed fire, fires designed to produce beneficial results, in the United States today? A recent survey (Ward and others 1993) indicated that over five million acres are treated annually by prescribed fire in the United States. Over 70 percent of all prescribed burning, or about 3.5 million acres, was in the Southeast. Purposes for using prescribed fire included hazard reduction, silviculture, wildlife habitat improvement, range improvement, vegetation management, and other reasons. The survey lumped such prescribed burning reasons as watershed management, pest control, disease control, and research in the category called "other". A category apparently not covered in the survey was the use of prescribed natural fire in national parks and wildernesses to perpetuate fire-dependent ecosystems. Many national parks and wildernesses across the United States have approved plans that allow lightning fires to burn when all prescription criteria have been met. Some of these individual prescribed natural fires have been 10-15 thousand acres or larger in size in the Rocky Mountains. Whether prescribed fires are ignited by managers or by natural causes, all prescribed fire plans include criteria for burning in such a manner to

minimize impacts on air quality. Resource management agencies and private timber companies cooperate with State Air Quality Bureaus to prescribe burn in a way that reduces adverse effects on human health and visibility.

We can see from this survey that prescribed burning practices are concentrated in the southeastern states. Also, although 5 million acres burned annually appears to be a large number, foresters and ecologists are projecting a much greater need for prescribed fire in the future to maintain, or restore, the health of fire-adapted ecosystems.

A DOUBLE STANDARD

A change in direction is clearly indicated--and that change has been embodied in the concept of ecosystem management where we attempt to sustain the productivity of all components of ecosystems, allowing society to enjoy the by-products of healthy systems. As we already have noted, recurring fire is an integral disturbance process to the functioning of fire-adapted ecosystems. But a double standard is impairing our ability to prescribe fire on the landscape on a large enough scale to truly sustain healthy systems. The double standard is simply one where practically any strategy can be adopted in suppressing a wildfire, any amount of money can be spent in implementing that strategy, and any outcome can be realized from good to bad. No matter how adverse the outcome (including the burning of 200,000 acres and the destruction of over 1000 homes in southern California in 1993), politicians and the general public will support the fire suppression specialist. A prescribed fire, on the other hand, can be well-planned and well-executed by qualified people, but the moment something goes awry the support from politicians and the public, and even internally, is quickly lost. The reprisal is generally immediate because the agency started the fire and it is their fault if something goes wrong. This double standard is part of the tradition and culture of many wildland fire management agencies, since the wildfire suppression decision is generously funded and essentially risk-free in the public arena.

The double standard even carries over into the way that regulatory agencies address wildland fire programs. Thus, the wildfire and its smoke are considered "natural events" by the Environmental Protection Agency, and are not as stringently regulated as prescribed fires to achieve clean air standards. We have learned by now that it is not a question of if we are going to have wildland fires, but simply a matter of when and where. And the wildfires are occurring at increasing frequencies and intensities, producing large volumes of smoke over extensive areas. Wildfire smoke is the bad smoke. This doesn't mean that prescribed fire smoke is good smoke, but it may be better smoke if emissions can be timed to mitigate the future production of unregulated wildfire smoke. Residents of the wildland/urban interface, air and water quality regulators, endangered species specialists, and resource managers need to plan for the "when" of fire occurrence.

An enlightened tolerance on the part of all sectors of society needs to accommodate prescribed fire on a landscape scale, coupled with other management practices, as part of the solution in sustaining healthy ecosystems to benefit people. This will require confronting the numerous barriers imposed either directly or indirectly by the double standard, and seeking appropriate solutions that better balance essential and strong fire suppression programs with equally well-supported prescribed fire programs. The list of elements receiving preferential treatment under the double standard is a varied one: liability, air quality, water quality, threatened and endangered species, risks, and funding. In most cases these considerations due not hamper operational practices in suppressing a wildfire. But this very same list can pose distinct barriers to prescribed fire practices.

NEW INITIATIVES

There are some breakthroughs today, however, in providing more latitude for expansive prescribed fire programs. The state of Florida, for example, has enacted innovative legislation that provides more protection for the prescribed burner in terms of liability. A cooperative program in Oregon among federal and state agencies is developing a fire emissions tradeoff model to predict the smoke emissions produced from prescribed fires and wildfires in the Blue Mountains of northeastern Oregon (USDA Forest Service 1993). The ultimate goal of this effort is to implement a level of prescribed burning that minimizes total smoke emissions. The Western States Air Resources Council (WESTAR), a non-profit association of air quality agencies in the fourteen western states, has drafted an initiative called "Forest Health Initiative to Restore Ecosystems" (FIRES). WESTAR's intent of FIRES is to "address forest health-air quality technical and policy issues of concern to Congress, the western state air regulators, federal land management agencies, and the public" (WESTAR 1994). The goal of the three year project is to bring together a broad-based consortium to develop regional solutions based on strong science to balance the needs of forest health while protecting air quality. All of these initiatives and others are providing more latitude for prescribed fire programs to evolve in a more supportive environment. Obviously two additional elements that need to be better resolved are the important issues of sufficient funding and the better sharing of risk by all stakeholders. Some progress is being achieved here as well.

Because many stands are now excessively dense and contain many dead and dying trees (Mutch and others 1993), sanitation and salvage, thinning, and partial cutting may be necessary before initiating extensive prescribed burning programs. In other situations resource managers and fire managers have been able to proceed with landscape scale prescribed burns: a 16,000 acre prescribed fire on the Santa Fe National Forest in April 1993, a 1,000 prescribed fire on the Boise National Forest, a 700 acre prescribed fire for wildlife winter range and forest health on the Lolo National Forest in April 1994, a 6000 acre prescribed fire on the Umatilla National Forest in 1994, and a 5000 acre aerially ignited crown fire on the Tetlin Wildlife Refuge in Alaska in 1993. Managers are clearly beginning to apply prescribed fire on scales large enough to produce some meaningful ecosystem effects.

Concern over another severe fire season in California in 1993 led to the establishment of a special interagency Fire Strategies Team in June 1994. The Team was composed of 13 different state, federal, and local fire and resource agencies, as well as 11 other private and local participants with diverse interests in watershed, fire, and environmental issues. The vision of the Team is to develop strategies to change the historical pattern of spending millions of dollars extinguishing large, damaging fires to a more balanced fuels and pre-fire management program (Board of Forestry 1995). Key goals of the Team are to achieve a sustainable ecosystem and the maintenance of healthy forests while providing defensible space for the protection of life and property.

Resource management agencies, regulatory agencies, politicians, and society have a challenging opportunity to implement meaningful resource management and fire management programs at a scale large enough to truly sustain the health of fire-adapted ecosystems to benefit people, property, and natural resources. This will require cooperation and consensus-building at a level never before experienced in resource management. People need to move away from litigation and the courtroom as strategies for managing natural resources. The emphasis now should be devoted towards the decades of research results that provide the basis for managing ecosystems more in harmony with disturbance factors to foster the health, resilience, and productivity of wildland ecosystems. Examples already exist where the double standard is being confronted and prior obstacles are being converted into opportunities for success. We simply need to build on those successes.

Mr. Chairman, this concludes my written statement; and I thank you again for the opportunity to participate in this important hearing.

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